We claim:

1. A method of depositing an optical quality silica film on a substrate, comprising:

forming said optical quality silica film on said substrate by plasma enhanced chemical vapor deposition (PECVD) in the presence of gases while controlling the total pressure of said gases; and

subjecting the as-deposited film to a low temperature treatment between 400° to 1200°C to minimize the presence of contaminant compounds in said film.

2. A method as claimed in claim 1, wherein said total pressure is controlled to minimize the presence of $Si\text{-}O_x\text{-}H_y\text{-}Nz$ compounds after said low temperature treatment.

3. A method as claimed in claim 2, wherein said low temperature treatment is about 800°C.

4. A method as claimed in claim 1, wherein the total gas pressure is controlled to be in the range of 2.0 to 2.6 Torr.

5. A method as claimed in claim 4, wherein said total gas pressure is about 2.4 Torr.

6. A method as claimed in claim 4, wherein said film is deposited in a vacuum chamber whose pressure is maintained by a vacuum pump having a controllable pumping speed, and said total gas pressure is maintained by controlling said pumping speed.

7. A method as claimed in claim 4, wherein said film is deposited at a temperature between 100 and 650°C.

8. A method as claimed in claim 7, wherein said film is deposited at a temperature of about 400°C.

9. A method as claimed in claim 4, wherein said gases comprise a raw material gas, an oxidation gas, and a carrier gas.

10. A method as claimed in claim 9, wherein said reactive gas is selected from the group consisting of: silicon tetra-chloride, $SiCl_4$, silicon tetra-fluoride, SiF_4, disilane, Si_2H_6, dichloro-silane, SiH_2Cl_2, difluoro-silane, SiH_2F_2 and any other silicon containing gases involving the use of hydrogen, H, chlorine, Cl, fluorine, F, bromine, Br, and iodine, I.

11. A method as claimed in claim 10, wherein said oxidation gas is selected from the group consisting of: oxygen, O_2, nitric oxide, NO_2, water, H_2O, hydrogen peroxide, H_2O_2, carbon monoxide, CO or carbon dioxide, CO_2.

12. A method as claimed in claim 11, wherein said carrier gas is selected from the group consisting of: helium, He, neon, Ne, argon, Ar or krypton, Kr.

13. A method as claimed in claim 9 wherein said raw material gas is SiH_4, said oxidation gas is N_2O, and said carrier gas is N_2 carrier gas.

14. A method as claimed in claim 9, wherein the flow rates of said gases are also controlled to optimize the quality of the deposited films after said low temperature treatment.

15. A method as claimed in claim 13, wherein the flow rates of said gases are also controlled to optimize the quality of the deposited films after said low temperature treatment.

16. A method as claimed in claim 15, wherein the flow rate of the SiH_4 is about 0.2 std liter/min.

17. A method as claimed in claim 16, wherein the flow rate of the N_2O is about 6.00 std liter/min.

18. A method as claimed in claim 17, wherein the flow rate of the N_2 is about 3.15 std liter/min.

19. A method as claimed in claim 1, wherein modifiers are incorporated into said films during deposition to modify the resulting refractive index.

20. A method as claimed in claim 19, wherein said modifiers are selected from the group consisting of: Phosphorus, Boron, Germanium, Titanium or Fluorine.

21. A method of depositing an optical quality silica film on a substrate, comprising:

forming said optical quality silica film on said substrate at a temperature between 100 and 650°C by plasma enhanced chemical vapor deposition (PECVD) in the presence of a raw material gas, an oxidation gas, and a carrier gas while controlling the total pressure of said gases to a pressure of between 2.0 to 2.6 Torr; and

subjecting the as-deposited film to a low temperature treatment at about 800°C to minimize the presence of $Si-O_x-H_y-Nz$ compounds after said low temperature treatment.

22. A method as claimed in claim 21, wherein said film is deposited in a vacuum chamber whose pressure is maintained by a vacuum pump having a controllable pumping speed, and said total gas pressure is maintained by controlling said pumping speed.

23. A method as claimed in claim 21, wherein said film is deposited at a temperature of about 400°C.

24. A method as claimed in claim 21, wherein said raw material gas is SiH_4, said oxidation gas is N_2O, and said carrier gas is N_2 carrier gas.

25. A method as claimed in claim 24, wherein the flow rate of the SiH_4 is controlled to be about 0.2 std liter/min, the flow rate of the N_2O is controlled to be about 6.00 std liter/min., and the flow rate of N_2 is controlled to be about 3.15 std liter/min.